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EXECUTIVE SUMMARY AND CERTIFICATION

Waste Management of Illinois, Inc (WMI) has completed the Phase I development of Old Milam Landfill in accordance with the Illinois Environmental Protection Agency (IEPA) Supplemental Permit No. 1988-163-SP. Hurst-Rosche Engineers, Inc. provided full-time quality assurance inspectors for the monitoring and testing of the following development activities:

1. Construction of the clay barrier layer within the Phase I Cell Area.
2. Construction of the leachate collection system.
3. Placement of final cover in the areas outside of the cell area.

Hurst-Rosche also provided field sampling, laboratory analysis and testing of the various soils and sands both before and after their placement.

Hurst-Rosche certifies that the development activities as reported herein were conducted in accordance with the IEPA approved final plans, performance standards, specifications, applications, supporting documents, and special conditions as referenced or defined in Supplemental Permit No. 1988-163-SP (October 12, 1988).

Respectfully submitted,

HURST-ROSCHE ENGINEERS, INC.

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CERTIFICATION REPORT

INTRODUCTION

The development of a cell of Old Milam Landfill for vertical expansion has been completed in Phase I. This document and its attachments provide certification that the development activities were performed in compliance with IEPA approved final plans, performance standards, specifications, applications and supporting documents, and special conditions as referenced or defined in Supplemental Permit No. 1988-163-SP (October 12, 1988). A plan sheet (Page 5) shows the general location of the developmental activities herein certified.

Development of Phase I consisted of:

1) Probing existing cover for thickness verification.
2) Construction of the barrier layer within the refuse placement cell.
3) Installation of the high density polyethylene liner (the certification of the liner is attached as a separate document).
4) Construction of a leachate collection system.
5) Final cover of Phase I outside of the refuse placement cell area.

For quality control purposes, the cell area of Phase I was divided into one-acre sections. This assured that the frequency of testing required by IEPA was maintained. These one-acre sections have been indicated on the plan sheets included in this submittal.

AS-BUILT REVISIONS

Certain as-built revisions were implemented during the construction of the Phase I area in order to resolve differences between the conceptual design plans and actual conditions encountered in the field. All as-built changes meet or exceed the performance standards set forth in the original design. The specific as-built revisions are described in detail below.

Alignment of Phase I Southern Boundary

The alignment of the south boundary of Phase I and the Phase I cell area has been revised. The new boundary line is located along north coordinate line 23,500 (see the general layout plan on page 5). This revision was instituted to properly align the south cell boundary with the base grade design.

Leachate Collection System

The leachate collection system has been revised to incorporate a closer pipe spacing. The closer pipe spacing is necessary to maintain the same leachate collection performance standards as described in the original design. The permeability of the as-built sand drainage layer is slightly less permeable than the specifications required, (2×10^{-3} cm/sec as compared to 5×10^{-3} cm/sec). This situation resulted from a more dense consolidation of the sand layer than expected, probably due to the combination of equipment vibration and high moisture content when placed. Slight variations in the grain size distribution of the sand may have also contributed to this result.

A recalculation of the flow distance was performed using the Wong Analysis and the actual sand layer permeability, while maintaining the steady state head and efficiency of the original design constant. The resultant necessary spacing is 160 feet. The as-built base grades were then analyzed to determine the best fit for the additional piping. Appendix K contains the recalculated Wong Analysis and revised leachate collection system piping plan.

PROBING EXISTING COVER FOR THICKNESS VERIFICATION

Probing of existing cover was completed at a rate of approximately four to six probes per acre inside the new refuse cell area; one probe per acre was completed in the remaining Phase I areas requiring final cover.

The locations and results of these probes have been summarized and included in Appendix A. Clay material was placed and spread in those areas when probing indicated that existing cover was less than two feet in thickness.

CONSTRUCTION OF THE BARRIER LAYER WITHIN THE REFUSE PLACEMENT CELL

Construction of a composite barrier layer within the new refuse cell area of Phase I was completed in stages. Grade stakes were placed on 100' x 50' grids. The cell floor was constructed maintaining a minimum 1% slope toward the Phase I leachate collection piping.

Clay material was placed throughout the cell area to construct the base grades and the barrier layer, and was compacted to 90% or greater of the Standard Proctor Maximum Dry Density of the material used. Nuclear density tests were completed on this layer at a rate of three tests per acre. Nuclear density tests were also performed on the perimeter berm. Density tests were completed in accordance with ASTM D2922 procedures. Results of density testing have been summarized and included in Appendix B.

Upon completion of material placement in the cell area, depth probes were completed at a rate of one probe per acre throughout the cell area to verify depths of placed material. Results of these probes have been summarized and included in Appendix C. All probed holes were backfilled and compacted with a clay/bentonite mixture, thus assuring soil barrier integrity. A before and after cross section survey was performed by Kuhlmann Design Group to further verify the soil subgrade thickness and grade. These are reflected in the as-built contours shown on Page 5 of this report.

In addition to probing and surveying, hydraulic conductivity tests were completed on the barrier layer at a rate of at least one test per 10,000 cubic yards. Results and additional discussion of this testing may

be found in Appendix D. The final stages of construction included the placement of the synthetic membrane liner and the construction of the perimeter berm. The high-density polyethylene (HDPE) synthetic membrane was then installed over the clay barrier layer. Quality assurance, quality control testing, inspection certification and data summaries on the HDPE synthetic membrane are provided as a separate document titled, "Certification of HDPE Liner Installation, Old Milam Landfill Expansion, Phase I."

CONSTRUCTION OF THE LEACHATE COLLECTION SYSTEM

A minimum twelve-inch layer of sand was placed and spread over the synthetic membrane. The thickness of the sand was measured at a frequency of one probe per acre. The results and locations of these measurements are shown in Appendix E.

The sand was tested for density at the rate of at least one test per 1000 cubic yards placed. These tests are summarized in Appendix F.

The hydraulic conductivity of the sand was measured at the rate of one test per 10,000 cubic yards placed. The results of these tests are shown in Appendix G.

The collection trench was V-shaped and lined with the HDPE synthetic membrane. A Trevira 1155 drainage fabric was installed above the HDPE liner and below the coarse aggregate of the leachate collection trench. A six-inch diameter, perforated, Schedule 80 PVC collection pipe was installed in the leachate collection trench. Backfill, above and below the pipe, was 3/4-inch washed gravel. The backfill was brought up a minimum of six inches above the top of the pipe. A Mirafi 140N drainage fabric was used to separate the aggregate backfill from the sand layer.

FINAL COVER OF PHASE I OUTSIDE OF REFUSE PLACEMENT AREAS

Final cover of Phase I areas outside of the refuse placement cell was completed in three stages. Clay material was placed and spread in lifts to form a two-foot barrier layer. This clay material was tested for compaction. This nuclear density testing is summarized in Appendix I. Hydraulic conductivity tests were performed on the two-foot barrier layer material at a rate of at least one test per 10,000 cubic yards placed. Results and additional discussion of this testing may be found in Appendix J. Upon completion of the two-foot barrier layer, a six-inch silty loam layer was placed and then a six-inch topsoil layer was placed. Grade stakes were set and marked in final cover areas so lift and cover thickness could be monitored. Upon completion of material placement in the final cover areas, probes were completed at a rate of one probe per acre to verify depths of placed material. Results of these probes have been summarized and included in Appendix H. All probe holes were backfilled and compacted with a clay/bentonite mixture, thus assuring final cover integrity.

Landscaping of the final cover surface consisting of seeding, fertilizing, and mulching the topsoil areas will be completed. A seed mix similar to IDOT Highway Mix, Class II, is to be used. Landscaping will be accomplished within sixty days of the completion of final cover construction.